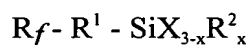


**WHAT IS CLAIMED IS:**

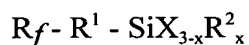
1. An antireflective article comprising a substrate having an antireflective surface and an antisoiling coating of less than about 100 Angstroms thick deposited thereon; wherein the antisoiling coating comprises a fluorinated siloxane prepared by applying a coating composition comprising a fluorinated silane of the following formula:



2. wherein:  $R_f$  is a perfluorinated group optionally containing one or more heteroatoms;  $R^1$  is a divalent alkylene group, arylene group, or mixture thereof, substituted with one or more heteroatoms or functional groups, containing about 2 to about 16 carbon atoms;  $R^2$  is a lower alkyl group; X is a halide, a lower alkoxy group, or an acyloxy group; and x is 0 or 1.
3. The antireflective article of claim 1 wherein the antireflective surface comprises a metal oxide film having one or more metal oxides.
4. The antireflective article of claim 2 wherein the antireflective surface comprises a sputter coated metal oxide film.
5. The antireflective article of claim 1 wherein the antisoiling coating comprises a fluorinated siloxane base film of an approximately monolayer thickness on which is adsorbed oligomeric fluorinated siloxane material in an amount that does not significantly reduce the antireflective characteristics of the antireflective article.

6. The antireflective article of claim 1 which has a first surface antireflectivity that is less than about 0.2 percent different than that of the same article without the antisoiling coating.
- 5 7. The antireflective article of claim 1 wherein the coating is prepared by applying a coating composition comprising a fluorinated silane wherein each X is a halide.
8. The antireflective article of claim 1 wherein the coating is prepared by  
10 applying a coating composition comprising a fluorinated silane wherein  $R_f$  is a perfluoroalkyl group of the formula  $C_nF_{2n+1}$  wherein n is about 4 to about 20.
9. The antireflective article of claim 8 wherein the coating is prepared by  
15 applying a coating composition comprising a fluorinated silane wherein  $R_f$  is a perfluoroalkyl group of the formula  $C_nF_{2n+1}$  wherein n is about 7 to about 10.
10. The antireflective article of claim 1 wherein the coating is prepared by  
applying a coating composition comprising a fluorinated silane selected from the  
group of  $C_7F_{15}CH_2OCH_2CH_2CH_2SiCl_3$ ,  $C_7F_{15}CH_2OCH_2CH_2CH_2Si(CH_3)Cl_2$ ,  
20  $C_7F_{15}CH_2OCH_2CH_2CH_2SiCl(OCH_3)_2$ ,  $C_7F_{15}CH_2OCH_2CH_2CH_2SiCl_2(OC_2H_5)$ ,  
 $C_8F_{17}SO_2N(Et)CH_2CH_2CH_2SiCl_3$ ,  $C_8F_{17}SO_2N(Me)CH_2CH_2CH_2Si(CH_3)Cl_2$ , and  
 $C_7F_{15}CH_2OCH_2CH_2CH_2Si(OAc)_3$ , and mixtures thereof.
11. An antireflective article comprising a substrate having an antireflective  
25 surface and an antisoiling coating deposited thereon; wherein the antisoiling  
coating comprises a fluorinated siloxane base film of an approximately  
monolayer thickness on which is adsorbed oligomeric fluorinated siloxane  
material in an amount that does not substantially change the antireflective  
characteristics of the antireflective article; wherein the fluorinated siloxane is  
30 prepared by applying a coating composition comprising a fluorinated silane of  
the following formula:

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wherein:  $R_f$  is a perfluorinated group optionally containing one or more  
5 heteroatoms;  $R^1$  is a divalent alkylene group, arylene group, or mixture thereof,  
substituted with one or more heteroatoms or functional groups, containing about  
2 to about 16 carbon atoms;  $R^2$  is a lower alkyl group; X is a halide, a lower  
alkoxy group, or an acyloxy group; and x is 0 or 1.

10 12. The antireflective article of claim 11 wherein the antireflective surface  
comprises a metal oxide film having one or more metal oxides.

13. The antireflective article of claim 12 wherein the antireflective surface  
comprises a sputter coated metal oxide film.

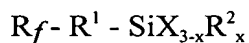
15

14. The antireflective article of claim 11 which has a first surface  
antireflectivity that is less than about 0.2 percent different than that of the same  
article without the antisoiling coating.

20 ~~15~~. An antireflective article comprising a substrate having an antireflective  
surface and an antisoiling coating deposited thereon; wherein the antisoiling  
coating is less than about 100 Angstroms thick and comprises a fluorinated  
siloxane base film of an approximately monolayer thickness on which is  
adsorbed oligomeric fluorinated siloxane material in an amount that does not  
25 significantly reduce the antireflective characteristics of the antireflective article.

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16. A method of applying an antisoiling coating to a substrate having an antireflective surface, the method comprising treating the antireflective surface with a coating composition comprising a fluorinated silane without subsequent processing; wherein the fluorinated silane has the following formula:



- wherein:  $R_f$  is a perfluorinated group optionally containing one or more heteroatoms;  $R^1$  is a divalent alkylene group, arylene group, or mixture thereof, substituted with one or more heteroatoms or functional groups, containing about 2 to about 16 carbon atoms;  $R^2$  is a lower alkyl group; X is a halide, a lower alkoxy group, or an acyloxy group; and x is 0 or 1.

17. The method of claim 16 wherein the coating is prepared by applying a coating composition comprising a fluorinated silane selected from the group of  $C_7F_{15}CH_2OCH_2CH_2CH_2SiCl_3$ ,  $C_7F_{15}CH_2OCH_2CH_2CH_2Si(CH_3)Cl_2$ ,  $C_7F_{15}CH_2OCH_2CH_2CH_2SiCl(OCH_3)_2$ ,  $C_7F_{15}CH_2OCH_2CH_2CH_2SiCl_2(OC_2H_5)$ ,  $C_8F_{17}SO_2N(Et)CH_2CH_2CH_2SiCl_3$ ,  $C_8F_{17}SO_2N(Me)CH_2CH_2CH_2Si(CH_3)Cl_2$ , and  $C_7F_{15}CH_2OCH_2CH_2CH_2Si(OAc)_3$ , and mixtures thereof.

18. The method of claim 16 wherein the antisoiling coating formed comprises a fluorinated siloxane base film of an approximately monolayer thickness on which is adsorbed oligomeric fluorinated siloxane material.

19. The method of claim 16 wherein the antisoiling coating formed is less than about 100 Angstroms thick.

20. The method of claim 19 wherein the antisoiling coating formed is at least about 20 Angstroms thick.

21. The method of claim 16 wherein the step of treating is carried out at room temperature.

22. The method of claim 16 wherein the coating composition comprising the  
5 fluorinated silane comprises less than about 2.0 weight percent of the fluorinated silane.

23. The method of claim 16 wherein the antireflective substrate is treated with a coating composition comprising a fluorinated silane for less than 30  
10 minutes.

24. The method of claim 23 wherein the antireflective substrate is treated with a coating composition comprising a fluorinated silane for less than about 10  
15 minutes.

25. The method of claim 16 wherein the step of treating comprises immersing the substrate in the coating composition comprising the fluorinated silane and removing the coated antireflective substrate, wherein upon removal the coated substrate emerges substantially autophobic.  
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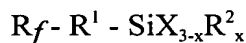
26. The method of claim 16 wherein the coating composition comprising the fluorinated silane further comprises a nonchlorinated solvent.

27. The method of claim 26 wherein the solvent is selected from the group of  
25 an alkane, a fluorinated alkane, an alkyl perfluoroalkyl ether, and mixtures thereof.

28. The method of claim 27 wherein the solvent is a mixture of a paraffinic solvent and an alkyl perfluoroalkyl ether.  
30

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29. A method of applying an antisoiling coating to a substrate having an antireflective surface, the method consisting essentially of treating the antireflective surface with a coating composition comprising less than about 0.5 weight percent of a fluorinated silane for less than 30 minutes; wherein the fluorinated silane has the following formula:

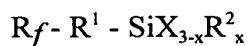


wherein:  $R_f$  is a perfluorinated group optionally containing one or more heteroatoms;  $R^1$  is a divalent alkylene group, arylene group, or mixture thereof, substituted with one or more heteroatoms or functional groups, containing about 2 to about 16 carbon atoms;  $R^2$  is a lower alkyl group; X is a halide, a lower alkoxy group, or an acyloxy group; and x is 0 or 1.

30. The method of claim 29 wherein the step of treating comprises immersing the substrate in the coating composition comprising the fluorinated silane and removing the coated antireflective substrate, wherein upon removal the coated substrate emerges substantially autophobic.

31. A method of applying an antisoiling coating to a substrate having an antireflective surface, the method comprising immersing the substrate in a coating composition comprising less than about 0.5 weight percent of a fluorinated silane for less than about 20 minutes and removing the coated antireflective substrate, wherein upon removal the coated substrate emerges substantially autophobic.

32. A method of applying an antisoiling coating to a substrate having an antireflective surface, the method comprising immersing the substrate in a coating composition comprising a fluorinated silane of the following formula:



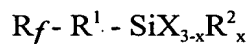
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wherein:  $R_f$  is a perfluorinated group optionally containing one or more heteroatoms;  $R^1$  is a divalent alkylene group, arylene group, or mixture thereof, substituted with one or more heteroatoms or functional groups, containing about  
5 2 to about 16 carbon atoms;  $R^2$  is a lower alkyl group; X is a halide, a lower alkoxy group, or an acyloxy group; and x is 0 or 1; wherein the antisoiling coating formed has a thickness of less than about 100 Angstroms.

33. The method of claim 32 wherein the antireflective surface comprises a  
10 metal oxide film having one or more metal oxides.

34. The method of claim 33 wherein the antireflective surface comprises a sputter coated metal oxide film.

15 ~~35~~ <sup>36</sup> A method of applying an antisoiling coating to a substrate having an antireflective surface, the method comprising immersing the substrate in a coating composition comprising a fluorinated silane of the following formula:

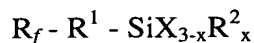


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wherein:  $R_f$  is a perfluorinated group optionally containing one or more heteroatoms;  $R^1$  is a divalent alkylene group, arylene group, or mixture thereof, substituted with one or more heteroatoms or functional groups, containing about  
2 to about 16 carbon atoms;  $R^2$  is a lower alkyl group; X is a halide, a lower  
25 alkoxy group, or an acyloxy group; and x is 0 or 1; wherein the antisoiling coating comprises a fluorinated siloxane base film of an approximately monolayer thickness on which is adsorbed oligomeric fluorinated siloxane material in an amount that does not substantially change the antireflective characteristics of the antireflective article.

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- 38  
36. A method of applying an antisoiling coating to a substrate having an antireflective surface, the method comprises immersing the substrate in a coating composition comprising less than about 0.5 weight percent of a fluorinated silane for less than about 5 minutes without subsequent processing; wherein the
- 5 fluorinated silane is of the following formula:



- wherein:  $R_f$  is a perfluorinated group optionally containing one or more
- 10 heteroatoms;  $R^1$  is a divalent alkylene group, arylene group, or mixture thereof, substituted with one or more heteroatoms or functional groups, containing about 2 to about 16 carbon atoms;  $R^2$  is a lower alkyl group; X is a halide, a lower alkoxy group, or an acyloxy group; and x is 0 or 1; wherein the antisoiling coating formed has a thickness of less than about 100 Angstroms and comprises
- 15 a fluorinated siloxane base film of an approximately monolayer thickness on which is adsorbed oligomeric fluorinated siloxane material in an amount that does not substantially change the antireflective characteristics of the antireflective article.

- 20 35  
37. An antireflective article made by the method of claim 32.

- 37  
38. An antireflective article made by the method of claim 35.

39. An antireflective article made by the method of claim 36.

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